

**Application  
for  
United States Letters Patent**

**To all whom it may concern:**

Be it known that GUY STONE, DANIEL SMITH, ALEXEY SUHIH,  
SALLY STONE and LAURA STONE

have invented certain new and useful improvements in

**INTERACTIVE MULTIPLE-VIDEO WEBCAM CHATROOM**

of which the following is a full, clear and exact description.

**INTERACTIVE MULTIPLE-VIDEO WEBCAM CHATROOM****FIELD OF THE INVENTION**

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The present invention relates generally to the process of using webcams in an Internet chatroom setting.

**10 BACKGROUND OF THE INVENTION**

Chatrooms are virtual lounges where a number of Internet users can meet to speak, or chat, about any subject of interest to them. The first Internet  
15 chatrooms appeared in April 1995(1) and the concept has quickly become a staple in the Internet world. Chatrooms attract a variety of users from throughout the world for the purposes of live ``talk,`` which is typically represented in text form as users type in  
20 and send their comments(2). Some Internet chatrooms also feature a single live photo image that users (also known as ``chatters``) can view once they enter the chatroom. These images are transmitted via a webcam (or ``webcam``) attached to the computer of  
25 the chatter who wants his/her image transmitted. Chatters can view the live image of one other chatter using webcam technology(3). A chatter who wishes to offer his/her image via webcam can set his/her camera to take a snapshot of him/her at  
30 his/her computers at preset intervals (i.e. every 30 seconds, 1 minute, etc.). In this way, the other chatters can see this person's image change at the same rate. The webcam can be positioned to take pictures of anything within the webcam's range (i.e.  
35 the chatter's companions in the same room, other sections of the room).

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sub b1/ In 1984, a company called White Pine developed CU-SeeMe, a video chat software. The company has since changed its name to CU-SeeMe Networks, and it hosts an Internet site (<http://www.cuseemeworld.com/>) which allows chatters to view live video and hear audio of other chatters(4). The site consists of several chatrooms organized by chatters' areas of interest (i.e. a relationship chat area, a women's chat area, a travel chat area, etc.). Each of these areas contains at least one chatroom. For instance, the travel chat area contains chatrooms for San Francisco, New York, Paris, etc. When a user enters a chatroom, he/she sees three squares at the top of the page. These squares are designed to display live video photos of the chatters. There are two rectangular regions below the video area. The one to the left is for chat text, and the one to the right contains a list of chatters. As is the case with many other Internet chatrooms, there is a blank space at the bottom of the page where chatters can type in their messages, and several buttons: "Send Chat" (to send chatter's typed message into the chat area), "Show Video" (to show video of a particular chatter), "Show Profile" (to display a profile of a certain chatter), and "Hang Up" (to leave the chatroom). The company's background is in videoconferencing, and their software reflects this. For instance, 1) the CU-SeeMe software program works only on the Microsoft Windows Platform; 2) the program only allows a maximum of 25 people in a single chatroom and displays a maximum of three webcam photos at the top of the page; and 3) CU-SeeMe World uses its own proprietary transfer protocol to transfer files to each user.

The invention disclosed in this application also provides for multiple webcam images in a chatroom environment, but there are several major differences

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in this invention and CU-SeeMe's technology: 1)  
This invention uses Java Programming Language, and  
the same program works across all platforms. That  
means it works in all computers that are capable of  
5 running a Java Virtual Machine. Today, most  
computers are equipped with a Java Virtual Machine,  
as are most web browsers (including Microsoft's  
Internet Explorer and Netscape's Navigator). This  
allows people to use the software without any  
10 additional plug-ins. 2) This invention has no  
limit on the number of users that are allowed to  
participate in the chatroom, and the computer-user's  
screen size is the only limit on the number of live  
webcam photos that can be displayed on the page.  
15 Those with small screens can view four live photos,  
for instance, and those with larger screens can view  
six or more live photos. In other words, the  
invention customizes itself to fit each user's  
computer system. 3) This invention uses well-defined  
20 Internet standards to transfer and display files.  
In addition to these differences, the process used  
to reach this invention was very different from the  
one used to reach the CU-SeeMe software program.  
The current CU-SeeMe site uses a program called CU-  
25 SeeMe Pro which allows for videoconferencing over  
standard telephone lines. That program was modified  
so that it would be useful over the World Wide Web  
and then chat functionality was added to it. The  
invention disclosed here took a standard web-based  
30 chatroom and added video capabilities to it.

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This invention provides a software program that allows users to chat with each other while displaying live webcam images of more than one selected user, within an Internet chatroom environment. The webcam images are displayed at the top of the chatroom page, and chat text runs below the images. Different webcams may transmit their images in different size, but this invention automatically makes all the images appear in uniform size. The invention also automatically assigns each image a position on the chatroom screen. If the number of chatters falls below the number of available image positions (or some chatters do not have a webcam or do not want their images projected) the program automatically displays a preselected logo (i.e. the logo of the company running the chatroom). Another outstanding feature of this program is that chatters can select the webcam images they want to view while they are chatting. Each webcam has a URL (Uniform Resource Locator) which the webcam owner programs into the webcam after purchasing it. This program asks each chatter for his/her URL and then organizes all the URLs of incoming chatters so that their webcam images are readily available to other chatters. The program provides a running list of the screen names of all participants in the chatroom. When a chatter enters, his/her screen name appears on the list. When the chatter exits, his/her screen name disappears, too. If, for instance, Chatter 1 prefers to view a webcam image of Chatter 13 or Chatter 4, he/she can do so immediately by double-clicking his/her mouse on Chatter 13's screen name. Chatter 13's image will suddenly appear at the top of the screen alongside

the images of the other chatters that Chatter 1 has  
chosen to view. The invention identifies each image  
by screen name. Chatters who do not have a webcam  
are identified by a common symbolic logo (i.e. the  
5 logo of the company or organization running the  
chatroom) in place of their image. The program  
updates the symbolic logo at a predefined interval.

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## BRIEF DESCRIPTION OF THE DRAWINGS

FIGURE 1 is a simple diagram how the client program works from a user's perspective.

This figure shows a general path that a user would take when using the client program over the Internet.

FIGURE 2 is a flow chart for the Chat portion of the client.

This diagram shows the order that the client sends requests to the server to update each individual piece of the software.

FIGURE 3 is a diagram showing the general architecture of the server portion of our project.

This shows the general flow the server portion of the program. The server portion relies heavily on multi-threading.

FIGURE 4 is a diagram showing a more detailed implementation of the thread that handles each client.

This shows the threads most basic states: sending & receiving. The thread receives a command from the client and then sends back a response.

FIGURE 5 is a drawing of a possible interface that appears on each chatter's screen. (The client program)

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This figure shows how the client program looks, how the elements on the interface work with one another to display the webcam images & text on each user's screen. The interactions that the chatter can take are also documented in this figure.

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**DETAILED DESCRIPTION OF THE INVENTION:**

Terminology Definitions:

5 Chatroom - An Internet-based technology that allows multiple users to virtually meet in one place and type messages to one another that will be visible to all within the room.

10 Web Camera - Any device attached to a computer that transmits images over the Internet, most commonly the World Wide Web.

15 WebCam - A generic term for any type of web camera.

Java Virtual Machine (or JVM) - A program that interprets compiled Java Code, which allows it to run on any computer platform.

20 Applet - A Java program that runs inside of a Java-enabled Web Browser.

SGML - A standardized markup language for defining the logical structure of a computer document.

25 HTML - A subset of SGML that is used to format documents over the Internet.

30 Multi-threading - The ability to run several threads at the same time. Each thread acts like a mini program that shares data with the main program.

Protocol - A standard way to send a message across some communication median.

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Graphical User Interface (or GUI) - A Window-based system, where the user of the system uses a mouse to point and click.

5 Discussion Room - A separate room inside the main chatroom that tends to be focused on a separate discussion. A chatter can only be a member of one discussion room at a time, and all of the messages sent into other discussion rooms are not posted.

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File Transfer Protocol (or FTP) (5)- A protocol that defines a way to copy files over the Internet.

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Transmission Control Protocol (or TCP) (6) - An open standard that defines how to connect and transfer data over the Internet.

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Username - Each user in the system is displayed by a name that they choose. All usernames have to be unique.

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Client - A program that acts as the front end to each individual user and runs on each user's machine. It receives all the chatroom information from the server via the Internet.

Server - The part of the program that runs on a centralized machine and keeps the client programs synchronized.

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Internet - The loose association of millions of computers that allows all users to communicate with one another.

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All Words ending ".java" - The name of the source code file that a description deals with.

10 This invention provides a system comprising a method which allows users to chat with each other while displaying live webcam images of more than one selected user within a chatroom environment. It also provides a method in which the webcam images are displayed at the top of the page. The invention  
15 also provides a method in which the displayed webcam images have a uniform size. It also provides a method in which the webcam images are automatically assigned a position on the chatroom screen. The invention also provides a method in which chatroom  
20 users can select the webcam images they want to view while they are chatting. It also provides a method in which each user is given a list of other online users from which they can select webcam images to view. It also provides a method in which a list of  
25 URLs from each user's personal webcam is requested and organized. The invention also provides a method in which each image is associated with an individual user. It also provides a method in which users who do not have a webcam will have a symbolic logo  
30 appear in place of their image. It also provides a method in which the symbolic logo is updated at a predefined time interval. The invention provides a system which allows users to chat with each other while displaying live webcam images of more than one  
35 selected user within a chatroom environment. The invention also provides a system in which the webcam

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images are displayed at the top of the page. It also provides a system in which the displayed webcam images have a uniform size. It also provides a system in which the webcam images are automatically assigned a position on the chatroom screen. The invention provides a system in which chatroom users can select the webcam images they want to view while they are chatting. It also provides a system in which each user is given a list of other online users from which they can select webcam images to view. The invention provides a system in which a list of URLs from each user's personal webcam is requested and organized. It also provides a system in which each image is associated with an individual user. It also provides a system in which users who do not have a webcam will have a symbolic logo appear in place of their image.

The invention also provides a system in which the symbolic logo is updated at a predefined time interval. It further provides a method in which the setting is an Internet chatroom; in which Java Programming Language is used; in which there is no limit on the number of users that are allowed to participate in the chatroom; in which well-defined Internet standards are used to transfer and display files; in which video capabilities are added to a standard web-based chatroom; and in which the setting is an Internet chatroom.

This invention further provides a basic text-based chatroom software that is written with the Java Programming Language and is distributed over the Internet. The webcam chatroom allows a user to view a live webcam image of the person with whom he/she is chatting. One unique characteristic of this

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invention is that it displays webcam images of more than one user's picture at the top of the window, while displaying beneath the images the text that each user types in. When a chatter first visits the chatroom, the program asks the chatter if he/she would like to enter the URL of his/her webcam. If the chatter is interested, he/she enters the URL, and the program automatically associates the URL with that chatter's screen name. When one chatter double-clicks on another's screen name, the program invokes an algorithm that automatically removes one of the multiple webcam images from the top of the chat screen and replaces it with a live image from the chosen chatter's webcam. Different webcam manufacturers have different resolutions, and the invention addresses these differences by using the core functionality in the programming language to resize every image so that they all appear in the same size in the chatroom.

This program contains two distinct parts: The client and the Server. Each part functions separately, but they communicate with each other using the TCP/IP protocol. This functionality is provided in the Java Programming Language by Sun Microsystems.

The client program is responsible for receiving the images and text to be displayed from the server. In addition to displaying the data it receives from the server, the client also allows the user to participate in the discussion by typing in text, and also allows the user to select whom they wish to see on top of the screen by double clicking on their username on the right hand side. The client displays the list of available discussion rooms and

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allows the user to create a new one. The client is also responsible to retrieve list of users logged in to each discussion room and to retrieve messages from the current discussion room the user resides in.

The server program is responsible for getting the user information from the client. That information tells the server where it needs to download the webcam image from (the URL of the image), what the user has typed into the text box, and which chatters the user wishes to have displayed. The server then goes and downloads the images off the Internet (using FTP) and then sends the images to the client. The server also receives whatever text the client sends it and then resends it to all of the clients connected to the server. The server also keeps the clients updated with information pertaining to which users are connected and what discussion rooms are available.

#### **Developer Notes:**

1. How webcam images are displayed at the top of the chatroom page

The program periodically refreshes the webcam images by retrieving the chatter list from the Server, which contains chatters and their webcam URLs. The program then prepares the image by connecting to the Server via TCP. It reads the byte-array for each image. The image is initialized for the screen and placed at the top of the chatroom area. The corresponding source code is available in VCC\_Chatter.java

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3. How the webcams are assigned a position on the screen

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4. How the system of selecting users works.

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[illegible]

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